

# Triaging Patients with Post-abortion Complications: A Prospective Study in Nepal

Shyam Thapa<sup>1</sup>, Jaya Poudel<sup>2</sup>, and Saraswati Padhye<sup>2</sup>

<sup>1</sup>Family Health International, Arlington, VA 22201, USA and <sup>2</sup>Paropakar Shree Panch Indra Rajya Laxmi Devi Prasuti Griha (Maternity Hospital), Kathmandu, Nepal

## ABSTRACT

The first manual vacuum aspiration (MVA) services unit in Nepal was established in 1995 at the country's largest national maternity hospital in Kathmandu. This research sought to assess and evaluate the safety, acceptability, and effectiveness of MVA services. This prospective study was conducted during 12 months in 1998, and follow-up was made at six weeks. Two groups of patients were compared: 529 patients treated in the MVA unit and 236 patients who were clinically eligible for treatment in the MVA unit but were treated instead in the main operation theatre (OT) owing to the unavailability of services in the MVA unit during the hours of their admission. The two groups differed with respect to some of their background characteristics but were similar in their clinical characteristics. The MVA group received contraceptive counselling and services and had significantly shorter stays in hospital. However, the direct cost incurred by the patients, regardless of the type of facility they used, was about the same. Follow-up at six weeks revealed that the MVA patients had significantly fewer complaints and were generally more satisfied with the services they had received than their counterparts. Slightly more than half of the women in the MVA group were using contraception at the time of follow-up compared to no women in the OT group. It is concluded that the MVA unit provided safe, effective, and efficient services to about 50% of all the patients admitted to the hospital with post-abortion complications. An additional 25% of the post-abortion patients could be served if the unit were kept open 24 hours a day, saving resources and time for patients and hospital staff. As a parallel development, both MVA and main OT services would need to be more effectively integrated with outside antenatal and family-planning clinics to address the reproductive health needs of women, thereby reducing the number of patients requiring post-abortion care.

**Key words:** Manual vacuum aspiration; Abortion; Counselling; Contraception; Healthcare; Prospective studies; Nepal

## INTRODUCTION

Ten to 20% of all recognizable pregnancies among women of reproductive age are estimated to result in spontaneous abortion due to many factors, and "it is not possible to ascribe a [single] cause with any certainty in the majority of the cases..." (1). Multiple causes may exist in any given case. Some clinically-identified causes include foetal death or disease, failure of the uterus

Correspondence and reprint requests should be addressed to:  
Dr. Shyam Thapa  
Senior Scientist  
Family Health International  
2101 Wilson Blvd, Suite 700  
Arlington, VA 22201  
USA  
Email: sthapa@fhi.org

to accommodate the pregnancy sac, and rupture of the membranes (1). Although maternal death is uncommon among patients with complications due to spontaneous abortion, those patients need immediate care and hence present a clinical challenge to healthcare providers. This also results in significant drain on the resources of health facilities (2).

Another group of patients needing immediate care are those with complications due to induced abortion. According to the World Health Organization (WHO), an estimated 15% of pregnancy-related deaths in developing countries occur due to complications of induced abortion (3). In some countries, the death rate may be as high as 50%.

Given that post-abortion complications constitute a large percentage of all gynaecological patients at hospitals in developing countries, WHO recommended that each service-delivery site in healthcare system of a country makes available at least some elements of emergency post-abortion care. Post-abortion care is defined as including three main elements: emergency health services to treat abortion-related complications; family-planning counselling, services, and referral; and linkage to other reproductive services (3-5). Participants at a 1998 global meeting on post-abortion care noted that "Women who have experienced complications from incomplete abortion are among the most neglected of reproductive health care patients" (6). For these various reasons, it is important not only to investigate the characteristics of patients who present at hospitals for post-abortion care, but also to identify, test, and evaluate resource-saving technological and management approaches to post-abortion treatment in various settings.

Conventionally, sharp curettage or dilatation and curettage (D&C) is used for treating patients with incomplete abortion. In this procedure, patients are put under general anaesthesia to remove the retained products of conception and stop vaginal bleeding. They are kept in the hospital, usually for several days, for post-treatment observation and monitoring. For certain types of patients who have complications due to incomplete abortion, a procedure that is being introduced in both developed and developing countries is manual vacuum aspiration (MVA) (7). The MVA procedure, which can be done with an electric or foot pump, or a specially-designed MVA syringe, requires only local anaesthesia and can be performed on an outpatient basis. Because of this and the fact that recovery is rapid, the procedure greatly reduces the cost to both service provider and patient.

Several studies have compared the safety, efficacy, acceptability, and cost-efficiency of the two procedures (8). The studies have concluded that the MVA procedure is safe, saves resources, and is beneficial to both patients (those who are eligible) and healthcare facilities. Introduced in the 1990s, the MVA technology is still relatively new, but it is starting to be considered a "mainstream activity of the reproductive health and family planning community" (6). The U.S. Agency for International Development (USAID) recognizes and supports post-abortion care as a 'reproductive health priority' (9).

In this paper, we analyze data collected prospectively over one year on patients with complications from abortion—spontaneous or induced—at the largest national maternity hospital in Nepal. The hospital opened an MVA service unit in 1995 to triage and treat patients with complications of incomplete abortion. It was anticipated that the unit would provide prompt services to those clinically eligible for them, offer high-quality care by keeping complications to a minimum, reduce costs to patients and the hospital, and offer MVA patients contraceptive counselling and services, which are not generally available to inpatients at the hospital (10).

We compare two groups of patients: those treated in the MVA unit and those who were clinically eligible for treatment in the MVA unit but underwent D&C in the operation theatre (OT) mainly because the MVA unit was not open at the time of their admission. We analyze the background and clinical characteristics, clinical outcome, contraceptive behaviour, and satisfaction of patients with the services rendered and received. Finally, we discuss ways in which the services to patients could be made more efficient and effective.

#### **Establishment of MVA service in Nepal**

In Nepal, the first MVA unit was established at Paropakar Shree Panch Indra Rajya Laxmi Devi Prasuti Griha (more commonly referred to as Prasuti Griha or Maternity Hospital), the country's largest national-level referral hospital, located in the capital city Kathmandu. As of 1998, the hospital had approximately 400 staff members, including some 42 physicians and 180 nurses. There were 55 gynaecological beds, including five in the MVA unit, and 150 obstetrical beds. The ratio of gynaecological to MVA beds was, thus, 10:1. The hospital had two major OTs—one for listed cases and another for emergency cases—and two minor OTs, including one for postpartum tubal ligation, which were used for treating patients with gynaecological and obstetric problems.

The MVA unit began offering its services in the last week of May 1995. It is open from 9 am to 4 pm, Sunday through Friday (until August 1997, the service hours were from 9 am to 2 pm). Except for one coordinator-cum-counsellor who is in charge of the unit, members of the medical staff are not assigned exclusively to that unit. The physicians assigned to the hospital's emergency calls attend to patients admitted to

the MVA unit. A patient pays Rs 500 (prior to mid-April 1998, the service fee was Rs 300), which is equivalent to the charge for a minor operation at the hospital, and Rs 80 as a flat charge on a 24-hour basis for a bed. An additional Rs 65 is charged for pads and medicine. Thus, the basic fee per patient (excluding other related costs, if any) is Rs 645 (or US\$ 9.50 at the 1999 exchange rate). [Rs 645 represents approximately five days' wages for a female labourer in the Kathmandu Valley]. Besides the basic services, ultrasound is used in about a quarter of MVA cases, and the charge for its use is Rs 300.

Patients admitted for treatment of complications due to incomplete abortion are eligible for the MVA unit if they meet the following criteria: uterine size of up to 12 weeks' gestation; os (lower portion of the cervical canal) open; stable physical condition as determined by pulse <100/minute, BP >60 diastolic, temperature <102.2 °F (<39 °C), haemoglobin level >7; and a non-rigid abdomen (10). Patients whose conditions do not meet these criteria are admitted to the main OT facilities for the D&C procedure.

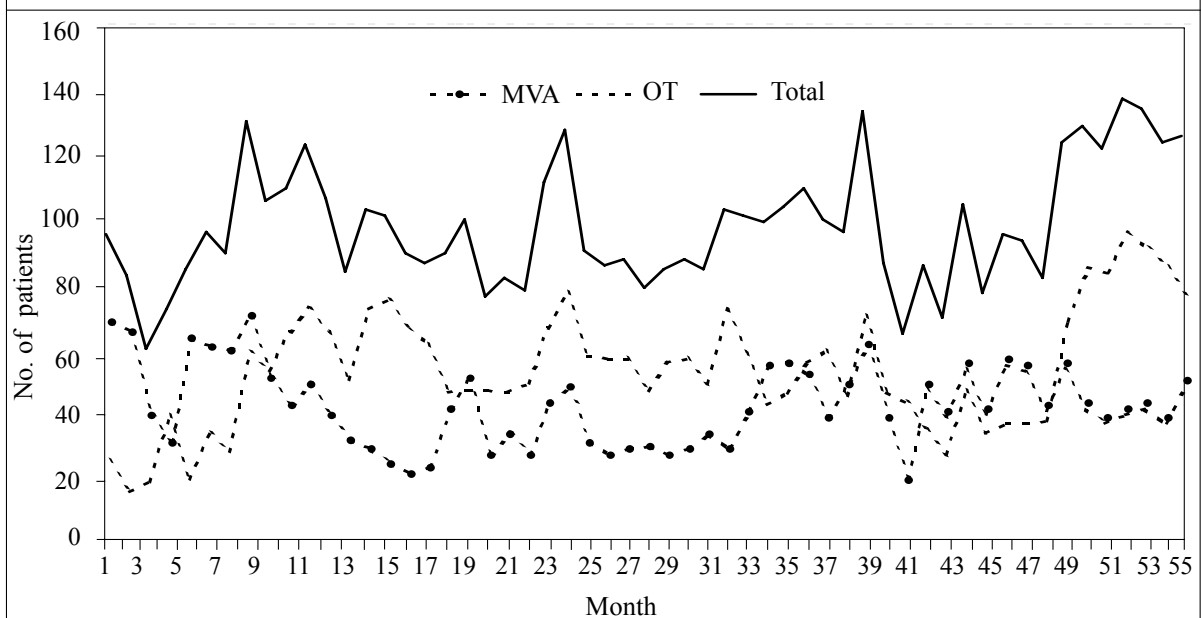
In the experience of the physicians and nurses who attend the procedures, it takes about 15-20 minutes to carry out the MVA procedure in the MVA unit and up to 25

minutes to carry out a D&C in the main OT. The time difference between the two procedures is, therefore, minimal, although there is an opportunity cost for doing a D&C in the OT because the time spent there could be used for treating patients with other complications.

By the end of December 1999, the MVA unit had treated 2,373 patients with complications of incomplete abortion, or 43.2% of all the patients admitted to the hospital with such complications since the MVA unit had begun its services. Figure 1 shows the trends during June 1995–December 1999 for three groups of patients: (a) those who were treated in the MVA unit, (b) those who were treated in an OT either because they did not meet the MVA service criteria or were clinically eligible for treatment in the MVA unit but arrived at the hospital during the hours when the MVA unit was closed, and (c) the total caseload of patients with post-abortion complications—that is, the sum of group (a) and (b).

The monthly caseload for the three groups of patients fluctuated considerably. The average numbers of patients per month were 43 (±13.5) for patients treated in the MVA unit, 57 (±19.2) for those clinically eligible but treated in the OT plus those who did not meet the MVA service criteria, and 100 (±19.8) for the combined MVA

**Fig. 1.** Monthly number of patients (n=5,489) with post-abortion complications treated in the MVA unit and in the OT of the Maternity Hospital, Nepal, June 1995–December 1999



Months 1 through 55 refer to June 1995–December 1999. The cases treated in each group during 28-31 May 1995 are included in the figures for June 1995; MVA=Manual vacuum aspiration; OT=Operation theatre  
Source: Maternity Hospital, Nepal

and OT group. We fitted ordinary least-squares regression to the data to establish trends for each group. The regression equation for the first, second, and third groups is  $Y=44.38-0.044x$ ,  $Y=44.15+0.447x$ , and  $Y=88.53+0.403x$  respectively. These results indicate that the average number of patients with complications of incomplete abortion, presented at the hospital, has remained about the same over time. The average number of cases with any kind of post-abortion complications, however, has been steadily increasing over the months. The rise is largely due to the OT caseloads.

### MATERIALS AND METHODS

Data collection for the study, which included a six-week follow-up of cases, began on 1 January 1998 and ended on 15 February 1999. All women who presented at the hospital with complications of incomplete abortion were considered eligible for the study.

We used a structured interview form. Each woman who consented to be interviewed was administered a questionnaire that took 20-25 minutes to complete. Each patient was assured of confidentiality and anonymity regarding the information she provided. The form included questions about the patient's demographic characteristics, recent and past gynaecological problems, including abortion, whether spontaneous or induced, and treatment. The form also recorded clinical data on the patient's laboratory tests and the clinical impression of the attending nurse regarding the present problem. Two trained staff conducted the interviews alternately. Because inpatients cannot leave the hospital until the business office opens in the morning, it was relatively easy to interview the inpatients. The interviews were conducted before or after treatment, depending on the physical condition of a patient and how she felt about giving the interview.

At the time of discharge from the hospital, each patient was informed that she was eligible for a complete health check-up in six weeks in the MVA unit. We inquired if she would be able and willing to come for the check-up. At follow-up, each patient was asked about her health since her previous visit to the hospital, whether she had encountered any health problems and, if so, what they were. One of the main objectives of the follow-up was to assess the contraceptive needs and use status of patients. The last follow-up was completed in mid-February 1999.

Throughout the study period, we maintained a log book in which we recorded the number and types of medical staff attending each type of operation at the hospital and another log book for documenting all types of surgery. We compiled these data so that we could estimate the actual volume of operations and the potential opportunity gained by the hospital for other types of operation by triaging the MVA patients.

The MVA service unit had been in operation for 30 months when the present study was begun. The main reason for delaying the study was to allow the MVA unit to develop a routine and, thus, to minimize 'noise' in the data. We decided to collect data covering a 12-month period to allow for seasonal variation in conceptions and births that are known to exist in Nepal (11) to capture time-variant influences of hospital and clinical management and to ensure a reasonably large number of cases for analysis.

Figure 2 shows the caseloads at the Maternity Hospital for all services provided during the 12-month study period. Gynaecological patients represented nearly 16% of all hospital admissions. Of them, 46% were admitted with complications of incomplete abortion. The hospital provided services to 83% ( $n=1,174$ ) of those patients; the remaining 17% (244 patients) did not receive any intervention. [Among the 244 patients not receiving intervention, 62% had 'threatened abortions' that ended in normal pregnancies, 30% had their abortions 'self-completed', and 8% left the hospital without seeking any further treatment or notifying the hospital, probably out of fear or because they did not have money to pay for services.]

Of the 1,174 cases who received treatment, nearly 46% were treated in the MVA unit, and the rest (54%) were treated in the OT. Of the latter, about 52% of the cases were treated in the OT because they did not meet the MVA service criteria. About 43% were treated in the OT because they came to the hospital when the MVA unit was not open. Five percent were treated in both MVA unit and OT because of complications that could not be handled in the MVA unit. Thirty-seven patients were eligible for the MVA services but were treated in the OT on account of their physician's or their own preference.

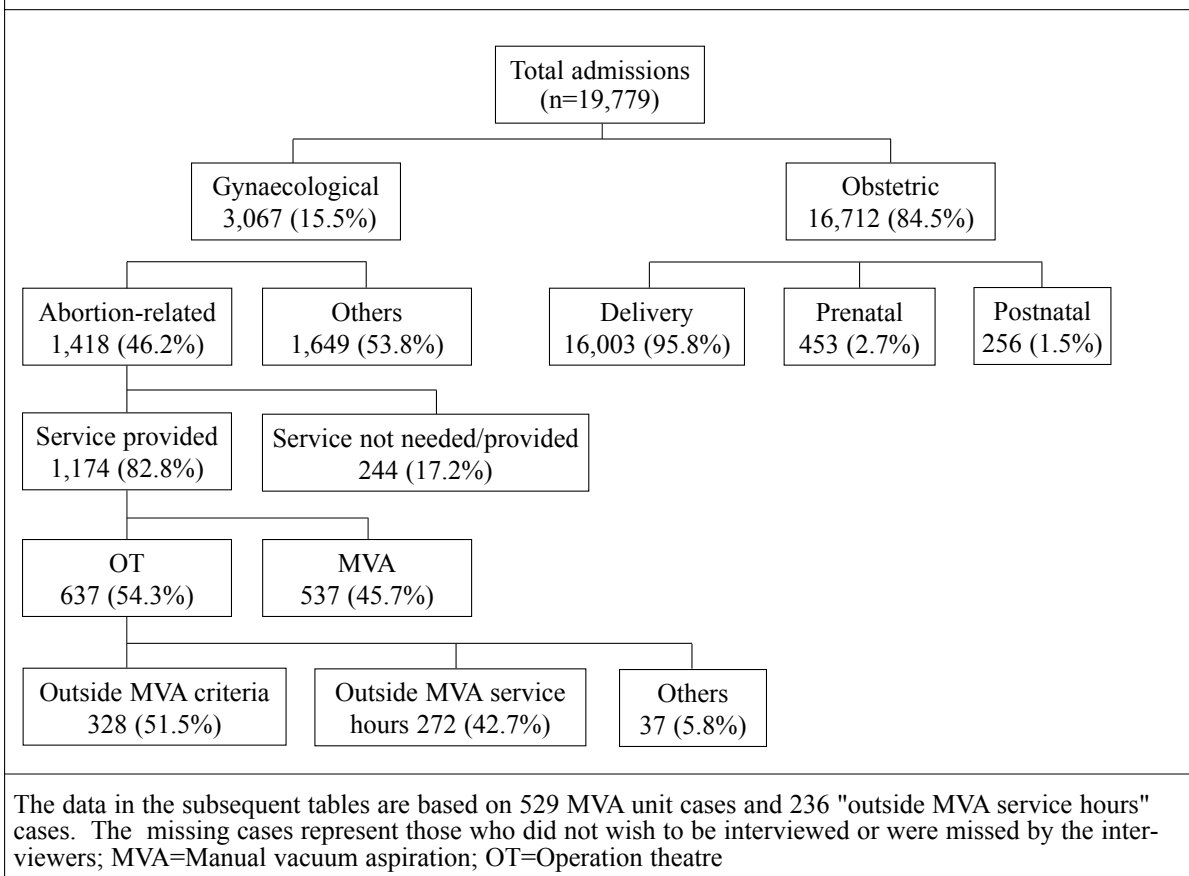
Of the 1,174 patients who received post-abortion services during the 12-month period, we were able to interview 1,116 patients (95%). The 58 patients who

were not interviewed either did not wish to be interviewed or were missed by the interviewers. The data analyzed here are based on 529 cases treated in the MVA unit and 236 cases treated in the OT because they were admitted to the hospital before or after the service hours of the MVA unit. We excluded 314 patients treated with D&C in the OT because they did not meet the MVA service criteria. We also excluded 37 cases who were treated in the OT because of their physician's or their own preference, although they were clinically eligible for the MVA procedure.

the MVA unit. In a sense, the two groups were 'naturally' assigned, the main criterion being the time of their arrival at the service site.

We hypothesized that the two groups would be similar in meeting the clinical eligibility criteria, but expected that they might differ with respect to where they came from and other background characteristics. We used the chi-square technique for comparing the categorical variables, the *t*-test for comparing the continuous variables, and logistic regression for multivariate analysis (12).

**Fig. 2.** Number of patients with gynaecological and obstetric problems admitted to the Maternity Hospital, Nepal, January-December 1998



The patients in the two groups were not randomly assigned. Data collection did not involve disruption of or intervention in the services being provided. The study was, therefore, designed to be strictly an evaluation of the existing services and did not entail the introduction of any new intervention. Patients assigned to the OT were triaged mostly on the basis that they came to the hospital for treatment after the service hours of

**RESULTS**

**Characteristics and clinical outcomes of MVA and OT patients**

Table 1, which presents the background characteristics of the two groups of patients, indicates a number of similarities between them. The two groups did not differ with respect to their prior use of contraception.

The numbers of days they had been bleeding prior to seeking admission were also similar. About 80% of the patients in each group had been accompanied by their husbands to hospital. The percentage of women working outside home were similar, although those women represented only a small fraction of all cases. The percentage of patients who had sought treatment prior to coming to the hospital were also similar.

Table 1 also reveals significant differences between the two groups. Slightly fewer than 24% in the MVA group were from outside the Kathmandu Valley compared to 31% in the OT group. The MVA patients had a higher average level of educational attainment than their counterparts. The OT patients were older by 2.4 years, on average, than the MVA group. Proportionately more patients in the OT group had been previously pregnant. They also had a larger number of living chil-

dren. Furthermore, proportionately more of them did not desire either the current or a future pregnancy. The two groups also differed with respect to their living arrangements; proportionately more women in the OT group lived in a joint family than did their MVA counterparts.

Age was positively associated with having been previously pregnant ( $r=0.468$ ,  $p<0.001$ ), not desiring the current pregnancy ( $r=0.368$ ,  $p<0.001$ ), and not wanting any more children in the future ( $r=0.548$ ,  $p<0.001$ ). The correlation was particularly strong ( $r=0.684$ ,  $p<0.001$ ) between the latter two measures (i.e. the percentage of women who said the current pregnancy was undesired and the percentage of women not desiring more children in the future). This suggests that most of those women who reported that the current pregnancy was not desired wanted to have no more children.

**Table 1.** Characteristics of MVA and OT patients with complications of incomplete abortion treated at the Maternity Hospital, Nepal, January-December 1998

Variable	MVA (n=529)†	OT (n=236)†
Residential location (percentage distribution)		
Within Kathmandu Valley	76.4	68.6*
Outside Kathmandu Valley	23.6	31.4
Education (mean years of schooling)	4.24	3.37**
Age (mean years)	23.50	25.93***
Experienced a previous pregnancy (%)	56.1	68.6***
Ever experienced a pregnancy wasted (%)	22.6	16.7
Mean number of living sons	0.40	0.60**
Mean number of living daughters	0.53	0.77**
Mean total number of living children	0.92	1.36***
Current pregnancy—undesired (%)	13.1	19.9*
Future pregnancy—undesired (%)	16.3	27.4***
Ever-used contraception (%)	29.8	37.4
Number of days bleeding (mean)	4.22	3.53
Sought treatment prior to hospital visit (%)	11.9	11.1
Amount of money (Rs) spent prior to hospital visit	677.00	1381.52
Admission time (percentage distribution)		
4 pm to 8 am	38.2	68.6***
8 am to noon	40.8	8.5
Noon to 4 pm	21.0	22.9
Working outside home (%)	12.9	8.5
Accompanied by husband (%)	79.8	80.5
Living in a joint family (%)	31.6	47.0***

†Number of cases for some variables may vary owing to missing information; \* $p<0.05$ ; \*\* $p<0.01$ ;

\*\*\* $p<0.001$ ; MVA=Manual vacuum aspiration; OT=Operation theatre

MVA refers to patients treated in the MVA unit. OT refers to patients who were clinically eligible for treatment in the MVA unit but were treated in the main operation theatre because they came to the hospital either before or after the service hours of the MVA unit

Just over one-tenth of the patients in each group sought treatment before coming to the hospital. The OT patients had spent more than twice as much on treatment as the MVA group before coming to the hospital, although the difference was not statistically significant. The lack of significance is probably due to the small number of cases in the OT group. The patients' reports of their expenditure on prior treatment ranged widely. Although the two groups had used similar types of healthcare facilities and personnel, the OT group reported spending significantly more than the MVA group. One possible reason for this difference may be that those who did not desire (or were uncertain about desiring) their current pregnancy were more likely than those who reported that their pregnancy was desired to have sought medical intervention before coming to the hospital—not to treat post-abortion complications but rather to induce abortion. The patients who did not want to be pregnant may have been given oral contraceptives or other types of medication or abortifacients. To test this hypothesis, we compared the expenses incurred by the two groups according to their fertility preference.

Of those who stated that their current pregnancy was desired, the expenses incurred by the two groups were similar. However, of those who said that their current pregnancy was unwanted or that they were uncertain about their desire for the current pregnancy, the OT group had spent significantly more than the MVA group (Rs 2,170 vs Rs 978,  $p < 0.01$ ). It, thus, appears that these patients may have attempted to terminate their pregnancy using abortifacients.

We used logistic regression to conduct a multivariate analysis in an attempt to identify the net influence of the variables differentiating the MVA and OT patients. In the regression, we coded the MVA group as 0 and the OT group as 1. We included the following independent variables because of their significant relationship in bivariate analysis: distance travelled, admittance time, age, amount of money spent prior to coming to the hospital, and living arrangement (nuclear or joint family). [A preliminary logistic regression analysis showed that age was the only significant proxy variable representing reproductive behaviour and fertility preference as measured by the number of previous pregnancies, desire for the current pregnancy, and desire for a future pregnancy. Hence, these variables were not included in the final regression analysis]. The final regression results showed that all these variables, except

the amount of money spent, significantly distinguished the two groups of patients. The amount of money spent prior to admission did not have an independent effect once age was introduced into the model. As already mentioned, however, it was positively and significantly related to the number of previous pregnancies and to not desiring the current or a future pregnancy, which were represented by age in the regression model.

Table 2 shows the clinical characteristics of the two groups, including uterine size (based on peripheral vascular [PV] examination), os status (based on PV findings), physical condition, gestational age (estimated from the date of the woman's last menstrual period), infection (defined by presence of uterine tenderness and septic shock with or without fever), foul-smelling vaginal discharge, and, finally, the clinical impression of the attending physician at admission. The attending physician classified an incomplete abortion as an induced abortion on the basis of multiple criteria, including the patient's oral history of her problem and its treatment, the presence of a foreign body in the uterus or evidence that one had been used, tenderness of the uterus, a smelly vaginal discharge, and septic shock.

We also compared the clinical characteristics of the MVA patients with the criteria for MVA eligibility, mentioned earlier. Only 14.2% of the patients treated at the MVA unit met all the criteria. However, when we considered only two criteria—uterine size of up to 12 weeks' gestation and os open, the most common criteria used by the attending clinic physicians, 94.1% of the MVA patients met the criteria. These data indicate that, in triaging the patients, the medical staff had considerably relaxed the criteria prescribed in the MVA clinical standards.

Despite this, the results clearly suggest that the two groups of patients were essentially similar with respect to the several clinical indicators considered. The two groups differed in only two measurements of their physical condition—haemoglobin level, which was lower for the OT group, and pulse, which was higher. A significantly higher percentage in the OT group received a blood transfusion, although in both the groups the percentage was below 7. The percentage of patients who might have induced their abortions was similar in the two groups.

Table 3, showing data on selected outcome indicators for the two groups, indicates that complication rates during the operative procedure were extremely

low, and most differences between the two groups were not significant. The amount of blood loss was significantly higher for the OT group. [Up to 50 mL of loss was considered minimal. For the MVA patients, the measurement container estimated the loss. For the OT group, the estimated loss was based on the number of pads soaked during the procedure].

The OT group also had a significantly longer stay (by 13.8 hours) in hospital. That difference would have been even greater if some MVA patients had not had to wait for the MVA unit to open.

As expected, only a small percentage in the MVA group received intravenous or general anesthesia. The

**Table 2.** Clinical description of MVA and OT patients with complications of incomplete abortion treated at the Maternity Hospital, Nepal, January-December 1998

Indicator	MVA (n=529)†	OT (n=236)†
Uterine size (weeks)	8.01	8.13
Gestational age (weeks)	10.97	11.07
Os status—open (%)	95.5	94.9
Physical condition		
Pulse	85.66	87.5***
Blood pressure (systolic/diastolic)	107.13/70.40	106.4/70.0
Temperature (°C)	36.71	36.72
Non-rigid abdomen (%)	25.0	29.0
Haemoglobin level (mg)	10.74	10.49*
Infection (%)	0.4	0.0
Foul-smelling vaginal discharge (%)	2.5	3.0
Received blood transfusion (%)	1.7	6.8***
Clinical impression of attending physician (percentage distribution)		
Abortion was spontaneous	95.8	95.3
Abortion was probably/certainly induced	4.2	4.7

†Number of cases for some variables may vary owing to missing information; \*p<0.05; \*\*\*p<0.001; MVA=Manual vacuum aspiration; Os=the lower portion of cervical canal; OT=Operation theatre  
MVA refers to patients treated in the MVA unit. OT refers to patients who were clinically eligible for treatment in the MVA unit but were treated in the main operation theatre because they came to the hospital either before or after the service hours of the MVA unit

**Table 3.** Outcomes of MVA and OT patients treated for complications of incomplete abortion at the Maternity Hospital, Nepal, January-December 1998

Indicator	MVA (n=529)†	OT (n=236)†
Any complications during operation procedure (%)	0.4	0.0
Amount of blood loss (mL)	17.54	26.30***
Intravenous/general anaesthesia given (%)	0.9	99.6***
Duration of stay in hospital (hours)	19.75	33.42***
Amount (Rs) paid for services	675.54	643.59
Patient counselled about contraception (%)	95.6	6.4***
Any contraceptive method dispensed (%)	50.7	0
Method dispensed (percentage distribution)		
Injectable (Depo-Provera®)	21.0	0
Pill	46.0	0
Condom	33.0	0
Willingness to return for follow-up (%)	87.1	76.7***

†Number of cases for some variables may vary owing to missing information; \*\*\*p<0.001  
MVA refers to patients treated in the MVA unit  
OT refers to patients who were clinically eligible for treatment in the MVA unit but were treated in the main operation theatre because they came to the hospital either before or after the service hours of the MVA unit



majority of women received verbacaine (verbal anaesthetic). Interestingly, the total amount of money paid for the services was higher for the MVA group than for the OT group, although the difference was not statistically significant. The slightly higher fee for the MVA patients was probably related to the fact that more MVA patients were advised to have an ultrasound, the cost of which is Rs 300 per patient. Because the ultrasound service at the hospital is available only between 9 am and noon, those who presented during those hours were more likely than others to undergo the ultrasound procedure. The advice of the medical staff to have an ultrasound may have been motivated, in some cases, by a desire to make additional money for the hospital. More than a quarter (27.4%) of the MVA patients had an ultrasound, whereas only 5.2% of the OT patients had an ultrasound.

Another reason for higher average payment by the MVA patients may be that those patients had to pay more for their antiseptic (Rs 42 per person) than the OT patients. The OT patients paid only Rs 17 for IV (intravenous) sedation-pentazocine and diazepam. However, the OT patients also paid for the attending anaesthetist.

Counselling about contraception differed significantly between the two groups. Whereas nearly 96% of the MVA patients were counselled about contraception before being discharged from the hospital, only about 6% of the OT patients received counselling. This difference was expected, since one of the functions of the MVA unit is to provide counselling about contraception and provide contraceptives, if appropriate for the patient.

Just over half of the MVA patients were given contraceptives before leaving the hospital, while no OT patients received contraceptives. Of those who did receive contraceptives, 21% received the injectable Depo-Provera®, 46% were given oral contraceptives, and 33% were given condoms. It should be emphasized that one-third of the patients were given condoms. Unlike injectables, implants, or IUDs, condoms and oral contraceptives require motivation by the recipient if they are to be used. Thus, only about one in five MVA patients had the certainty of contraceptive protection from the method dispensed. Their subsequent contraceptive behaviour could be assessed only by following them up after a period of time.

#### Sequelae and subsequent contraceptive use

The objectives of follow-up at six weeks were to assess the general health of the patients and to learn about their

contraceptive behaviour. We decided on a six-week interval to ensure a reasonable follow-up rate; a longer time interval could have increased the probability of losing patients to follow-up. Each patient who indicated her willingness to come back was given a card indicating the date for her return and the clinic. The MVA unit was specified as the venue regardless of where the woman had been treated.

The percentages of patients who indicated their willingness, at the time of their discharge from the hospital, to return for follow-up at six weeks differed significantly between the two groups: 87% among the MVA patients versus 77% for the OT group. The other women indicated their intention to come back only if they developed significant health problems. When we excluded those patients who had come to the hospital from outside the Kathmandu Valley, the intention-to-return rates jumped to 92% and 85% ( $p=0.08$ ) for the MVA and OT groups respectively. Distance was clearly a strong disincentive to return.

Although 87% of the MVA patients and 77% of the OT patients had indicated their willingness to return for follow-up, only 72.8% and 55.1% respectively actually returned six weeks later. Thus, the gap between intended and actual return was 14.3 and 21.6 percentage points, respectively, for the MVA group and the OT group, indicating that the actual follow-up rate for the OT group was considerably lower than that for their counterparts. If, however, we limit the comparison to those patients who had indicated their willingness to return, 83.6% of the MVA group and 71.6% of the OT group actually showed up for the six-week follow-up. These should be considered fairly high follow-up rates.

Using bivariate and multivariate analyses, we compared the characteristics of those MVA patients who did not return for follow-up ( $n=144$ ) with those who did ( $n=385$ ). The purpose was to learn the direction of biases, if any, in the follow-up data. The variables we considered and their respective categories were the same as those listed in Table 1. The bivariate results indicate that the two subgroups were similar ( $p>0.05$ ) with respect to most of their characteristics. Of the variables examined, age and the number of living children were significantly higher among those who did not return for follow-up than among those who did. Another variable that showed a significant association ( $p<0.0001$ ) was willingness to return for follow-up (Table 3). As expected, age and the number of living children were highly correlated in both the groups.

The multivariate logistic regression analysis confirmed that age and hence parity were highly and negatively associated with follow-up. Older women with higher parity, who were, thus, more experienced with child-bearing, were probably more confident about the outcome of care they had received than were younger women with fewer children, and that may be the reason for their lower rate of return. The single best predictor of follow-up among the MVA group, however, was intention to return: those who expressed their willingness to return were the most likely to return for follow-up and those who indicated unwillingness to return were the least likely to do so.

We carried out a similar analysis with two subgroups of the OT group, those who came for follow-up and those who did not. The bivariate results showed that the subgroups differed in only a few characteristics studied. The patients who came for follow-up (n=103)

had a significantly ( $p<0.05$ ) higher level of schooling than those who did not (n=106). The more-educated group seems to have valued follow-up more than did those with less schooling. The willingness-to-return variable was, however, not significantly associated with the actual follow-up rate. The OT patients may have simply given an affirmative response when asked whether they were willing to return. Because the characteristics of those who returned and those who did not were similar for subgroups in both MVA and OT groups, the data on follow-up can be considered generalizable to patients who did not return, although it is plausible that those who returned for follow-up were the ones who had specific problems or queries about their health.

Table 4 presents data on the health condition of the patients, their preference for childbearing, and contraceptive behaviour at follow-up. About a quarter of the followed-up patients in the OT group had health complaints,

**Table 4.** Health condition, attitude towards pregnancy, and satisfaction with services reported at six-week follow-up by MVA and OT patients treated for complications of incomplete abortion at the Maternity Hospital, Nepal, February 1998–February 1999

Variable	MVA (n=385)†	OT (n=130)†
Any health complaint (%)	13.5	23.8**
Nipple discharge (%)	7.5	9.9
Vaginal discharge (%)	13.6	22.0*
Abnormal PV findings (%)	16.2	11.1
Feeling of good health today (%)	84.0	82.4
Resumption of menses (%)	77.9	79.2
Resumption of sexual intercourse (%)	95.9	96.0
Attitude towards pregnancy, if pregnant soon (percentage distribution)		
Happy	61.5	52.4
Unhappy	27.1	28.6
Indifferent	11.4	19.0
Desire for next pregnancy (percentage distribution)		
Within 15 months	79.8	64.1***
After 15 months	4.5	3.9
No more	11.4	20.3
Not sure	4.3	11.7
Most liked aspect of services provided (percentage distribution)		
Generally all types of services	69.3	43.0***
Other specific aspects	12.0	18.2
Nothing specifically liked	18.8	38.8
Most disliked aspect of services provided (percentage distribution)		
Behaviour of staff	5.6	18.0***
Asking for gratuity	0.3	9.0
All others	1.9	12.3
Nothing specifically disliked	92.2	60.7

†Number of cases for some variables may vary owing to missing information; \* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$   
MVA=Manual vacuum aspiration; OT=Operation theatre; PV=Peripheral vascular

significantly more than in the MVA group. The main problems they reported were fever, abdominal pain, and bleeding. The proportion of women with vaginal discharge was also significantly higher in the OT group. More than four-fifths of the women in both the groups reported that their menses had returned. Of those women, the median number of days since the return of their menses was 15, indicating that their menses had returned within a month following treatment. Nearly all the women had resumed sexual relations during the six weeks since treatment.

The percentage of women desiring to have a child as soon as possible or within the next 15 months was higher in the MVA than in the OT group. This difference is related to the fact that the women in the MVA group had fewer living children (Table 1). Correspondingly, proportionately more women in the OT group did not want to have any more children.

We included in the survey an open-ended question about the woman's satisfaction with the services she had received. The responses were coded later. More than two-thirds of the women in the MVA group were generally satisfied with the services rendered to them, but only about two-fifths of the women in the OT group reported general satisfaction. Specific aspects that both the groups liked included the behaviour of the staff, the services, cleanliness of the facility, and (among the MVA group) the provision of family-planning counselling and services. More than 90% of the clients in the MVA group stated that there was not any particular aspect of the services that they disliked. About two in five of the OT group disliked certain aspects of the services. These data indicate that services in the MVA unit were generally more satisfying than in the main section of the hospital.

As indicated in Table 5, 70% of the women in the MVA group were satisfied with the information about contraceptives they had received at the time of discharge. An additional 24% of that group said that they could have been given more information and probably counselling as well. In contrast, nearly all the women in the OT group said that they had not received any information or counselling about contraceptives while in hospital. Contraceptive information and counselling are not routinely provided as part of the services for inpatients at the Maternity Hospital, although the hospital has a large family-planning clinic on its premises for outpatients. The missing link may, therefore, be

simply a system for referring inpatients to the family-planning clinic services. The percentage of women in the OT group who had previously used contraception was even higher than that in the MVA group (Table 1). This suggests that the OT patients would have been responsive to family-planning information and counselling.

Of the followed-up MVA patients, 54% reported using contraception at the time of follow-up six weeks after discharge. Of the followed-up patients who had initiated the use at the time of the discharge from the hospital, 76% were still using at six weeks. Less than 2% of the MVA patients had switched to another method during the six-week time period. Nearly 25% had stopped using contraception between the time of discharge and follow-up. Of those stopping, the discontinuation rate was the highest (40%) among those using condoms, followed by those using the pill (25%). The main reasons for discontinuation were the desire for another child and their husband's objection. Other reasons included bleeding and objection by other elder family members. Of women who were continuing to use contraception, the median intended duration of use was 12 months. In contrast with the MVA patients, fewer than 1% of the OT patients were currently using, or had used contraception, since discharge from hospital.

The reasons given for not using contraception after discharge from hospital differed significantly between the MVA group and the OT group. For both the groups, the main reason was the desire for another child; but 79% of the MVA patients who had not used any method mentioned this reason compared to 54% of the OT patients. Proportionately more women in the OT group reported not using any method for fear of, or because of, actual side-effects. Proportionately more women in the OT group gave miscellaneous reasons, such as planning to get sterilized, objections by the family or husband, and preferring to use a 'safe' method (withdrawal or periodic abstinence) for not using a method.

The survey also asked the followed-up patients if they had any specific questions about their healthcare. About two-thirds in both the groups said that they did not. Of those who did, most questions were about weakness or dizziness, where they should go for a health check-up in the future, how they could obtain information and counselling about family planning (this was asked by the OT group), what they should do

about vaginal discharge/burning/bleeding, how likely they were to have a miscarriage in the future, and whether they should be concerned that they had not resumed menstruating. Proportionately more women

wanted to have another child as soon as possible or within the next 15 months. The majority of those women were using condoms or the pill. One reason for their condom use was probably that they had been

**Table 5.** Contraceptive use, continuation, and reasons for discontinuation reported at six-week follow-up by MVA and OT patients treated for complications of incomplete abortion at the Maternity Hospital, Nepal, February 1998–February 1999

Variable	MVA (n= 85)†	OT (n=130)†
Satisfied with information about contraception provided (percentage distribution)		
To full extent	70.0	0.8***
To some extent	23.6	3.3
Not at all or no information	6.4	95.9
Currently using any contraceptive method (% among all women)	53.5	0
Continuously using any method since discharge (% among all women)	75.5	0
Continuously using Depo-Provera® (%)	100.0	0
Continuously using pill (%)	75.0	0
Continuously using condom (%)	60.0	0
Switched to another method (%)	1.4	0
Reasons for discontinuing contraceptive use (percentage distribution among those discontinuing)		
Desire for another child	48.1	0
Husband's dislike/objection	33.3	0
All other reasons	18.5	0
Reasons for not using any method (percentage distribution among non-users)		
Desire for another child	79.0	54.2***
Away from husband	5.7	2.5
Side-effects	1.7	18.6
No knowledge about methods	1.7	8.5
All other reasons	11.9	16.1

†Number of cases for some variables may vary owing to missing information; \*\*\*p<0.001; MVA=Manual vacuum aspiration; OT=Operation theatre

in the OT group had questions than did those in the MVA group and that was probably due to the lack of prior counselling for the OT group.

#### Potential for contraceptive use

As noted earlier, 53.5% of the MVA patients but none of the OT patients reported using contraceptives at follow-up. One way to assess patients' potential use of contraception is to consider their preference regarding a future pregnancy. The data are presented in Table 6. Of the women in the MVA group not currently using contraception, nearly 89% wanted to have another child as soon as possible or within 15 months and about 9% did not want any more children or wanted to have a child only after 15 months. In contrast, 72% of those currently using contraception in the MVA group

advised to use condoms at least for a while after receiving the treatment. Those women were likely to discontinue using any method in the near future.

On the one hand, if potential contraceptive users are considered as those women who were not currently using contraception but (a) wanted to have no more children, (b) wanted to have another child only after 15 months, and (c) were unsure about their desire for another child, the upper-bound estimate of potential users in the MVA group would be 58.8%, or only 5.3 percentage points higher than the current percentage using in the MVA group. On the other hand, if we exclude both those women who were currently using a method but wanted to have another child as soon as possible or within 15 months and those who were

unsure about having another child, the percentage of women using contraception could be only 16%—considerably fewer than the percentage currently using. This may be considered a lower-bound estimate for the MVA group.

In contrast, in the OT group, 64% of the women not using any method wanted to have another child as soon as possible or within the next 15 months. About 24% of the women who were currently not using any method did not want any more children or wanted a child only after 15 months. Some of those women might become users if proper counselling, good-quality service, and assurance of follow-up in case of a problem were provided. The lower-bound estimate of the percentage of

indicator of how well a programme is doing. Of critical importance are fully understanding clients' reasons for wanting or not wanting to use a method, assessing their needs in relation to their fertility preferences, and providing accurate information to them—all of which are elements of a good counselling system.

**Potential for better use of resources**

The MVA patients who received treatment at the OT constituted nearly one in five (18.8%) of all minor surgical interventions performed at the hospital during the 12-month study period (Table 7). The ratio of minor surgery (excluding cases carried out in the MVA unit) to major surgery was 0.55. If the 18.8% cases treated in the OT had been treated instead in the MVA unit, the

**Table 6.** Current contraceptive-use status by desire for a future pregnancy among MVA and OT patients treated for complications of incomplete abortion and followed up six weeks later at the Maternity Hospital, Nepal, February 1998–February 1999

Desire for another child	MVA		OT	
	Not using contraception (%)	Using contraception (%)	Not using contraception (%)	Using contraception (%)
As soon as possible or within 15 months	88.6	72.1	64.1	0
After 15 months	2.9	6.0	3.9	0
No more	5.7	16.4	20.3	0
Not sure	2.9	5.5	11.7	0
Total	100.0	100.0	100.0	0
(N)	(175)	(201)	(128)	(0)

The number of patients with missing information in the MVA and OT groups was 9 and 2 respectively  
MVA=Manual vacuum aspiration; OT=Operation theatre

women who could potentially use contraception in the OT group is, thus, 24.2%.

Overall, if all the followed-up (MVA and OT) women who were not using contraception but wanted to have another child after 15 months, did not want another child, or were unsure about future childbearing are added to the group who were current users, the potential proportion of current users would be as high as 71%. This scenario is unlikely, however, because a large percentage of the women in the MVA group wanted to have a child in the near future. Hence, if we consider only those non-users who desired to have another child only after 15 months or not at all as net potential users of contraception, the total proportion would be only 24.2% (or 32.4% if the 'unsure' subgroup is also included).

These data on current contraceptive-use status and reasons for non-use suggest that mere use of a method at six-weeks' follow-up is not necessarily an accurate

ratio would have been lower (0.45), implying the opportunity for doing more major surgery in the OT.

**Table 7.** Major and minor surgeries performed at the Maternity Hospital, Nepal, January–December 1998

Item	Number/ratio
All major surgeries	2,282
All minor surgeries	1,784
Minor cases treated in the OT	1,255
PAC cases treated in the OT owing to limited hours of MVA unit	236
Other minor cases in the OT	1,019
PAC cases treated in the MVA unit	529
Ratio of minor to major cases	
Excluding MVA unit cases	0.55
Including MVA unit cases	0.78
If PAC cases in the OT had been treated in the MVA unit	0.45

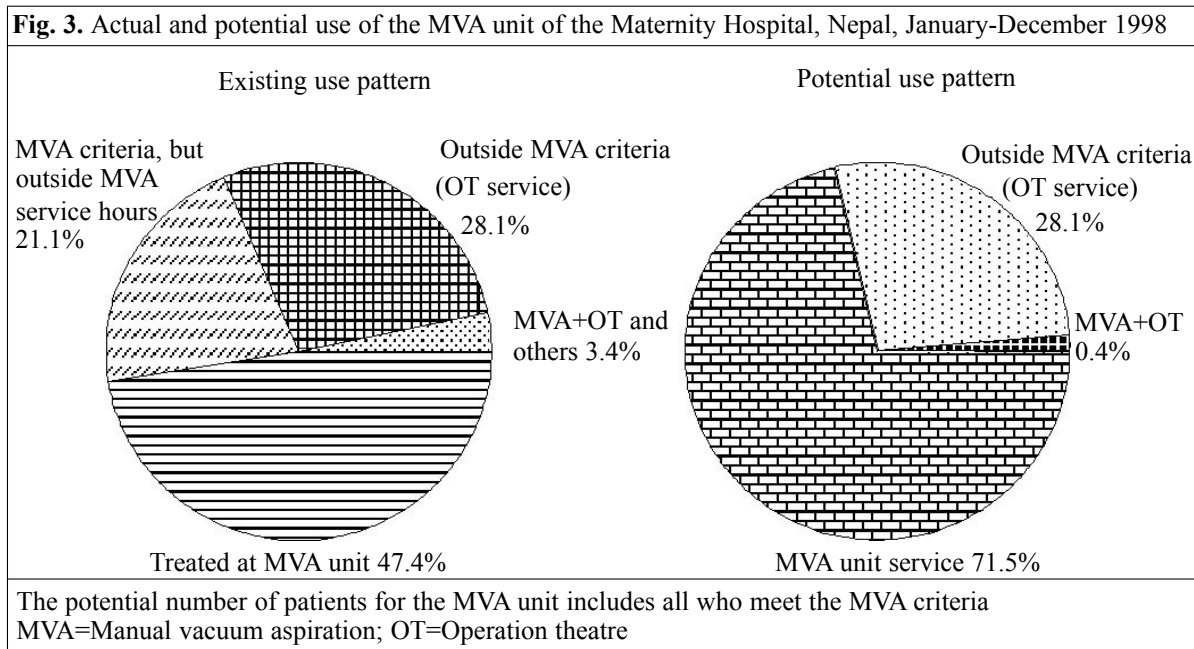
PAC=Post-abortion complications

The OT patients (n=236) stayed a total of 7,868 hours in hospital. [This total is based on the average number of hours spent in hospital by an OT patient]. As shown in Table 3, the OT patients spent, on average, 33.42 hours, whereas the MVA patients spent only 19.75 hours. Had they obtained their services in the MVA unit, they would have stayed only 4,614 hours. Thus, they would have stayed 58.6% fewer hours in the hospital. The hospital usually has an overflow of patients and, therefore, the freed-up beds would have been put to use by other patients. In addition, the hospital would have been able to use the physicians and anaesthetists for other major surgical cases.

treated in the MVA unit. About 28% of the cases, however, would still require treatment in the OT (Fig. 3).

## DISCUSSION

This prospective study found that the introduction of the MVA technology at the largest public-sector maternity hospital in Nepal enabled it to provide safe and effective services to about 50% of all the cases with post-abortion complications. The records on safety observed in the data from this hospital are essentially similar to those found elsewhere in similar settings in the world (8). The patients treated in the MVA unit received con-



Switching eligible patients to the MVA unit and, thereby, shortening their stay in hospital, however, would not necessarily have reduced the cost to those patients. As discussed earlier and shown in Table 1, the cost of treatment in the MVA unit was about the same as treatment in the OT. Nevertheless, the cost to the MVA patient could be reduced by charging for the use of a bed by the hour rather than by a 24-hour flat rate as is currently practised and by reducing the charge for the MVA procedure, which at present is equivalent to the charge for minor surgery in the OT.

We also estimated the potential use of the MVA unit if its service hours could be extended from 7 to 24 hours per day. Of the total number of patients with post-abortion complications, nearly three-quarters could be

traceptive counselling and services. They had significantly fewer complaints and were generally more satisfied with the services they had received than their counterparts. However, the study also found that the direct cost incurred by the patients, regardless of the type of facility they used, was about the same. Furthermore, the average time spent by those treated in the MVA unit at the hospital was nearly 20 hours, considerably less than by those treated in the OT, but much more than expected. The main reason for this was the limited MVA unit service hours and the timing of patients' arrival at the hospital.

The experience at the Maternity Hospital shows that there is a great potential for making the MVA unit more efficient. At the time of the study, only about half

of the women eligible for its services were receiving treatment there because the unit was open only seven hours a day and six days a week. If the unit were kept open 24 hours every day, nearly three-quarters of all post-abortion patients could be served by the MVA. This would result in considerable savings of resources and time for both patients and the hospital.

Even if the unit were always open, one-quarter of women with post-abortion complications would not be eligible for its services and would still need treatment in the OT. Unlike the patients served by the MVA unit, women treated in the OT are not offered family-planning counselling or contraceptives. There is no reason to assume a priori that contraceptive services would not be acceptable to or needed by OT patients treated for post-abortion complications. If the experience of MVA patients is any indication, OT patients may be receptive to using contraception to avoid unwanted pregnancies. In fact, during post-treatment follow-up, proportionately more women in the OT group than in the MVA group reported that they did not want any more children. This finding underscores the need to also offer family-planning counselling and referral services to OT patients. Their counselling needs would be addressed if they were treated at the MVA unit itself. However, a special effort would still be required to address the contraceptive needs of women who are not clinically eligible for the MVA unit service, a separate group not included in the present analysis. Better integration of post-abortion treatment and family-planning services, basically through effective referrals, could also address other aspects of the reproductive health needs of women, thereby reducing the number of patients requiring post-abortion care.

In addition to the family-planning component, it seems equally important to provide for information, counselling, and effective referral for safe-motherhood or antenatal services. The percentage of patients in both MVA and OT groups, who desired to have another child in the near future, was higher than the percentage of women who wanted to delay or limit their childbearing. WHO and others have recommended that additional reproductive health services be offered to women as part of their care for post-abortion complications (4,7). Although Nepal's Maternity Hospital offers antenatal services, the only component of reproductive health services offered to post-abortion patients is family-planning counselling and referral in its MVA unit. Better integration of its reproductive health services could be

achieved through the development of an effective referral system within the hospital.

Based on the experience of the MVA unit and on insights gained from this study, two major modifications have already been made in the MVA services unit at the Maternity Hospital. First, MVA service hours have been extended to provide round-the-clock services. Second, nurses have been trained to provide the services. Aside from the Maternity Hospital, MVA units have been established in several district hospitals outside the Kathmandu Valley. The MVA unit at the Maternity Hospital has, thus, served as a prototype for the introduction of MVA services elsewhere in the country. In the district hospitals, nurses have been trained (in procedures and counselling) to be the front-line service providers. The decentralization of services through the use of nurses is probably the most effective means of expanding MVA services in a country like Nepal. However, the clinical success and impact of this initiative remain to be assessed.

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